

DETAILED ACTION

Response to Amendment

1. Applicant's request for again reconsideration of the finality of the rejection of the last Office action (mailed on 1/3/2008) is persuasive during the interview the Applicant had on 1/26/2008 with Charles Rones and the Examiner and, therefore, the finality of that action is withdrawn.

2. Applicant's Amendment filed on 5/1/2007 has been entered with newly added claims 19-38 and cancelled claims 1-18. In this Office Action, claims 19-39 are pending.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 19, 28 and 38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application

was filed, had possession of the claimed invention. Applicant specification does not properly defined the phrases "training dataset" and it is considered as new matter. Applicant did not define identifying step in the specification. Therefore Applicant is claiming a new matter, see for example, claim 19, line 5.

5. following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 19, 28 and 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. "identifying one or more predetermined feature types within each image, or a region thereof, of a plurality of images of a training dataset." Applicant has left several steps before the identification step.

7. The claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to conform to current U.S. practice. Claim 21 is rejected, because pronouns are not permitted in the claim. Only what is being referred to by "its" should be set forth in the claim. Thus, the claimed on page 3, line 2-3 recitation as "geometry its scale" renders the claim vague and indefinite.

Claim Rejections - 35 USC § 101

8. 35 U.S.C. § 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. Claims 19-39 are rejected under 35 U.S.C. § 101, because none of the claims are directed to statutory subject matter. Independent claims 19, 28 and 38 merely claiming nonfunctional descriptive material, i.e., abstract ideas. Even when a claim that recites a computer that solely calculates a mathematical formula or a computer disk that solely stores a mathematical formula is not directed to the type of statutory subject matter eligible for patent protection. The claims are not producing useful, concrete and tangible results. See *Diehr*, 450 U.S. at 186 and *Gottschalk v. Benson*, 409 U.S. 63, 71-72 (1972).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates

of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 19-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mojsilovic et al. (US Patent 7,043,474) hereinafter Mojsilovic, in view of Jain et al. (US Patent 5,913,205) hereinafter Jain, and in view of Essafi et al. (US Patent 6,642,929) hereinafter Essafi.

12. As per independent claim 19, 28 and 38, Mojsilovic teaches a method for characterizing, annotating and determining image similarity based on semantic meaning of images (col. 4, lines 40-42). Mojsilovic teaches the claimed, identifying one or more predetermined feature types within each image, or a region thereof, of a plurality of images of a training dataset (Fig. 9, col. 13, lines 64-67), Mojsilovic does not explicitly teach visual object category. However, Jain teaches the claimed, the method of transforming a visual object category into a model comprising parameters which define said visual object category (Fig.2, col. 9, lines 30-37). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention, to have combined the teachings of the cited references because Jain's teachings would have allowed Mojsilovic's method to provide a way to compare images in different schemas and to compare images faster (col. 3, lines 55-57). Mojsilovic teaches the claimed, comparing a set of images identified during said database search with said stored model and calculating a likelihood value relating to each image based on its

correspondence with said model (Fig. 2, col. 8, lines 19-27). Mojsilovic teaches the claimed, classifying said features in terms of descriptive variables defining one or more characteristics of said features and a spatial relationship there between (col. 2, lines 53-57). Mojsilovic and Jain do not teach using probability function. However, Essafi teaches the claimed, estimating model parameters are modeled by probability density functions (Fig. 8A-B, 9A-B, col. 7, lines 56-59). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention, to have combined the teachings of the cited references because Essafi's teachings would have allowed Mojsilovic's method to provide a way without splitting the image in the same domain or ranges (col. 3, lines 5-8).

The other limitations of claim 28, calculating a likelihood value relating to each image based on its correspondence with said model by comparing said set of images with said model (Fig. 2, col. 8, lines 19-27); and Mojsilovic do not explicitly teach ranking images. However, Jain teaches the claimed, ranking said images in order of said respective likelihood values, to thereby determine the relevance of a set of images relative to a specified visual object category (Fig.2, col. 9, lines 60-63).

13. As per dependent claim 20, Mojsilovic and Jain combined teach the claim 19. Jain teaches the claimed, storing said model (Fig. 2, col. 9, lines 34-37).

14. As per dependent claim 21, Mojsilovic teaches the claimed, each feature is represented by one or more parameters, which parameters include its appearance and/or geometry, its scale relative to the model, and its occlusion probability (col. 2, lines 53-57).

15. As per dependent claim 22, Mojsilovic and Jain do not explicitly teach estimating the probability. However, Essafi teaches the claimed, the step of comparing an image with said model includes identifying features of the image and estimating the probability densities of said parameters of those features to determine a maximum likelihood description of said image (Fig. 8A-B, 9A-B, col. 7, lines 56-59). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention, to have combined the teachings of the cited references because Essafi's teachings would have allowed Mojsilovic's method to provide a way without splitting the image in the same domain or ranges (col. 3, lines 5-8).

16. As per dependent claim 23, Mojsilovic and Jain do not teach using Gaussian probability function. However, Essafi teaches the claimed, probability density functions comprise Gaussian probability functions (col. 10, lines 63-65). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention, to have combined the teachings of the cited references because Essafi's teachings would have allowed Mojsilovic's method to provide a way without splitting the image in the same domain or ranges (col. 3, lines 5-8).

17. As per dependent claim 24, Mojsilovic teaches the claimed, selecting the training dataset of images from a large dataset (database) (Fig. 1, col. 7, lines 26-30).

18. As per dependent claim 25, Mojsilovic teaches the claimed, at least two different models are created in respect of a set of images retrieved from said database (Fig. 8, col. 9, lines 41-43).

19. As per dependent claim 26, Mojsilovic and Jain combined teach the claim 1. Jain teaches the claimed, selecting one of said at least two models as said visual object category model (Fig. 2, col. 9, lines 60-63).

20. As per dependent claim 27, Mojsilovic and Jain combined teaches claim 1. Jain teaches the claimed, selecting step is performed by calculating a differential ranking measure in respect of each model, and selecting the model having the largest differential ranking measure (Fig.2, col. 9, lines 60-63).

21. As per dependent claim 29-30, Mojsilovic and Jain combined teach the claim 28. Jain teaches the claimed, set of images is retrieved by means of a database on said specified visual object category and the input as a word or a set of words describing said visual object category (Fig. 2, col. 9, lines 60-63).

22. As per dependent claim 31, Mojsilovic and Jain do not explicitly teach estimating the probability. However, Essafi teaches the claimed, the step of comparing an image with said model includes identifying features of the image and estimating the probability densities of said parameters of those features to determine a maximum likelihood description of said image (Fig. 8A-B, 9A-B, col. 7, lines 56-59). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention, to have combined the teachings of the cited references because Essafi's teachings would have allowed Mojsilovic's method to provide a way without splitting the image in the same domain or ranges (col. 3, lines 5-8).

23. As per dependent claim 32, Mojsilovic teaches the claimed, comparing a set of images retrieved from said database with said stored model and calculating a likelihood value relating to each image based on its correspondence with said model (Fig. 2, col. 8, lines 19-27).

24. As per dependent claim 33, Mojsilovic and Jain combined teach the claim 1. Jain teaches the claimed, ranking said images in order of said respective likelihood values or retrieving further images corresponding to said specified visual object category (Fig. 2, col. 9, lines 60-63).

25. As per dependent claim 34, Mojsilovic and Jain combined teach the claim 28. Jain teaches the claimed, features comprises at least two types of parts of an object (Fig. 2, col. 9, lines 30-37).

26. As per dependent claim 35, Mojsilovic teaches the claimed, categories include pixel patches, curve segments, corners and texture (Fig. 15A-B, col. 23, lines 30-33).

27. As per dependent claim 36, Mojsilovic teaches the claimed, all of the images of said set of images are used to create the model (Fig. 8, col. 9, lines 41-43).

28. As per dependent claim 37, Mojsilovic teaches the claimed, selecting a sub-set of said set of images for use in creating said model (Fig. 8, col. 9, lines 41-43).

29. As per independent claim 39, Apparatus for ranking, according to relevance, images of a set of images retrieved from a database relative to a specified visual object category, the being arranged and configured to a visual object category into a model defining features of said visual object category and a spatial relationship therebetween, store said model, compare a set of images identified during said database search with said stored model and calculate a likelihood value relating to each image based on its correspondence with said model, and to said images in order of said respective likelihood values. This claim is rejected under the same rationale as claim 1.

Response to Arguments

30. Applicant's arguments filed 5/1/2007, 11/9/2007 and during interview arguments have been fully considered but they are not persuasive and details as follows:

- a) Applicants new drawings of Fig. 1 and 2 filed on 5/1/2007 overcomes the drawings objection. Therefore, the objection is withdrawn.
- b) Applicants Specification amendment filed on 5/1/2007 overcomes the Specification objection. Therefore, the objection is withdrawn.
- c) Applicants cancelled old claims 1-18 and added new claims 19-39, filed on 5/1/2007 over comes the claims objection. Therefore, the objection is withdrawn.
- d) Applicants argument regarding claims 1, 17-18 were rejected under 35 U.S.C. 112, second paragraph for indefinite because the claims were distinct from the specification and claims 5 and 8 were rejected for using the indefinite phrase "and/or" respectively. However, Applicants cancelled old claims 1-18 and added new claims 19-39, filed on 5/1/2007, and moot to discuss the rejection.
- e) Applicants argument regarding claims 1-18 rejection under 35 U.S.C. 101 because independent claims 1, 17-18 were directed to non-functional descriptive

material, i.e., abstract ideas. However, Applicants cancelled old claims 1-18 and added new claims 19-39, filed on 5/1/2007, and moot to discuss the rejection.

f) In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Jain's abstract states "Object attributes can be extracted over the entire image or over only a portion of the object. A schema is defined as a specific collection of primitives." Col. 16, lines 54-57 state that "Structure -- This primitive is used to capture the shapes which appear in the image" Primitives include "Global Color", "Local Color", "Structure", and "Texture". See also, col. 7, lines 60-66, states that "Primitive are either global, computer over an entire image, or local, computer over smaller regions of the image." So shapes (objects) within an image appear to be disclosed. In this sense, it appears that Jain would be able to disclose that the object (lion on one side) would be able to say the image is the same an image of a lion on the other side of the image, if the image shapes were extracted and the localization (which I cannot find in the claim), however the "over the entire image" or over "local" can be interpreted as localized determination of an object" as argued. Further, Jain

teaches as “the new images are provided as inputs to the Visual information retrieval (VIR) Engine 120. Visual objects associated with a particular domain may be stored in a portion or a partition of the entire database. Visual objects of multiple domain or subsets of a domain could be stored in separate databases or may be stored in one database. The VIR Engine 120 has two modules, image analysis module 122 and image comparison module 124. The image analysis module 122 receives inputs from either modules 108 or 110 are to generate a query target or from the insertion module 112 for adding the new image into the database 112. This is the classification of visual image objects part. Then the second module, image comparison module 124 receives a query target feature vector (FV) and a FV for the image being tested or compared one at a time to the query from the database engine 130. For details see Jain Fig. 2, col. 3, lines 30-65). Mojsilovic teaches the claimed limitation, “identifying one or more predetermined feature types within each image or a region, a plurality of images of a training dataset” as the image similarity metric embodies the experimental results and may be used to annotate images or to search the database 104, see Mojsilovic at Fig. 9, lines 64-67.

Conclusion

31. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sathyanarayan Pannala whose telephone number is (571) 272-4115. The examiner can normally be reached on 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Rones can be reached on (571) 272-4085. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2164

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sathyanarayan Pannala/
Primary Examiner

srp
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